Haemoparasitismin Small Ruminants in Gwagwalada Metropolis, Federal Capital Territory, Abuja, North Central Nigeria

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ABSTRACT

This study investigated the prevalence of haemoparasites of small ruminants reared under semi-intensive system in Gwagwalada Area Council, FCT Abuja, Nigeria. Blood samples were collected from 200 animals; 100 goats and 100 sheep, and were examined for haemoparasites. The results showed that out of the 200 animals examined, 40(20%) of the animals were infected with blood parasites. Of these infected animals, 19(47.5%) were goats, while 21(52.5) were sheep. Anaplasma species recorded the highest prevalence rate of 10.5% in both sheep and goats. This was followed by Theileria species 9.5% and Eperythrozoon specie and Babesia specie had a prevalence of 0% each. The prevalence of the infection was higher in older animals (22.57%) than younger ones, which was (17.5%). The prevalence was also slightly higher in female animals (23.64%) than in male which is 15.55%, prevalence of haemoparasitic infection also varied with the different breeds of goats and sheep, among the breed of goats West African dwarf had the highest prevalence (10%) whereas Uda had the highest prevalence (20%) among breeds of sheep. while in the management, animals managed under semi intensive system had 20% prevalence and healthy animals had 20% prevalence. There was no significant relationship between the diseases of goats and sheep (P>0.05) Considering the risk factors, there was no significant difference (P>0.05) between haemoparasitism and the age, sex, and breed(goats) while there was a significant different (P<0.05) between haemoparasitism and breed of sheep. It was therefore concluded there was a low prevalence of blood parasites recorded in this study, their owners may not have noticed the effect of the parasites on the animals because they are apparently healthy due to the subclinical or chronic nature of the infection which often do not result in mortality, however their effects is usually manifested in production losses in the form of diminution of productive potential such as decreased growth rate in lambs and kids, late maturity, weight loss, and increased susceptibility to other diseases.

key words: Haemoparasites, Anaplasma, Theileria, Small ruminants, Blood parasites

INTRODUCTION

Small ruminants are one of the major domestic animals of the inhabitants of the study area. Disease is an important constraint to increase production of food animal for human consumption in most part of the world. Diseases limit and in some instances, even preclude the development of viable animal industries wherever they occur. Tick-transmited diseases are economically important globally\(^1,2,3,4\). Most apparent are diseases caused by gene
ral blood parasites, such parasites include Anaplasma, Babesia, Eperythrozoon, Cowdria, and Trypanosomae species etc, which are found in the blood of mammals. Haemoparasites continues to be a major constraint to livestock production in sub-saharan Africa. The detrimental role which parasitic diseases play in livestock production has been emphasized. However, determination of the degree of parasitic infection depends mainly upon the age of the host, the breed, the parasite species involved, and the epidemiological patterns which include husbandry practices and physiological status of the animals. The study was therefore aimed at investigating the prevalence of haemoparasite infection in small ruminants and the possible correlation between age, sex, breed, management health status and state of production for the purpose of prophylaxis and effective control of the disease.

Materials and methods

Study area
Gwagwalada metropolis is within Gwagwalada Area Council which is one of the six Area Councils of the Federal Capital Territory, Abuja- Nigeria. The town lies between latitude 8°-25′11 and 9°-29′11 and longitude 6°-45′11 and 7°-45′11 east of the Greenwich. It has a guinea savannah type of vegetation, with raining season stretching from April to October and dry season from November to March.

Study population.
Small ruminants (100 sheep and 100 goats), kept on a semi intensive system, were randomly selected in households in Gwagwalada Metropolis. The study was carried out between the months of November 2013 and January 2014 (early dry season). Their age, sex, breed, management health status and state of production were also recorded.

Collection and examination of blood.
5ml blood sample were collected aseptically, using disposable syringes from the jugular vein of each animal into heparinized tubes and sent to the Parasitology and Entomology laboratory of the Faculty of Veterinary Medicine, University of Abuja for examination. A drop of blood was placed near one end of a clean glass slide and a spreader was used to prepare the thin smear. The smear was allowed to air-dry. The dried blood smear was fixed in Methylalcohol (absolute) for 2 minutes and allowed to dry. The smears were placed on a staining trough and stained with 3% Giemsa stain for 30 minutes. After that, the smears were washed with phosphate buffered saline (PBS) to remove excess stains. The slides were then air-dried and examined under oil immersion (x100) lens for haemoparasites.

Statistical analysis
The data collated were analyzed using descriptive statistics (percentages and tabulations). The chi square and odds test was used to determine the association between the occurrence of haemoparasites in relation to age, sex, breed, management health status and state of production. Values of P<0.05 were considered significant.

RESULTS
A total of 200 small ruminants comprising of 100 sheep and 100 goats were sampled in the area. The prevalence of Anaplasmaovis was found to be 12% and 9% in goats and sheep respectively while Theileriaovis was found to be 12% and 7% in sheep and goats respectively while Eperythrozoon and Babesia parasites were not found in the blood of the animals examined as shown in the table 1.
Table 1: Overall prevalence of haemoparasites in sheep and goats

<table>
<thead>
<tr>
<th>Parasite species</th>
<th>Anaplasmaovis</th>
<th>Theileriaovis</th>
<th>Eperythrozoanspp</th>
<th>Babesiaovis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep(100)</td>
<td>9(9%)</td>
<td>12(12%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Goats(100)</td>
<td>12(12%)</td>
<td>7(7%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Total(200)</td>
<td>21(10.5%)</td>
<td>19(9.5%)</td>
<td>0(0%)</td>
<td>0(0%)</td>
</tr>
</tbody>
</table>

Table two shows the risk factors on the prevalence of haemoparasites in sheep and goats in Gwagwalada area council. 7(8.8%) of the small ruminants under the age group of 0 to 6 months were infected with Anaplasma and Theileria parasites respectively, while 14(12.2%) and 12(10.4%) above the age of 6 months were infected with Anaplasma and Theileria parasites respectively. Animals in the age bracket of 6 months and above were more infected by haemoparasites than those in the age bracket of less than six months, although, there was no statistically significant difference (P>0.05) between the age and infection with haemoparasites.

8(8.9%) and 6(7.0%) of the males were infected with Anaplasma and Theileria parasites respectively, while 13(11.8%) of the females were infected with Anaplasma and Theileria parasites respectively. The females were found to be more infected with haemoparasites than the males. There was no statistically significant difference (P>0.05) between the sex of animals and infection with haemoparasites.

8(6.7%) and 4(3.3%) of West African Dwarf goats were infected with Anaplasma and Theileria parasites respectively, while 4(5.0%) and 3(3.7%) of Sokoto Red goats were infected with Anaplasma and Theileria parasites respectively. 0(0%) and 9(18.0%) of Balami Sheep were infected with Anaplasma and Theileria parasites respectively, while 2(2.0%) of Yankasa sheep were infected with Anaplasma and 7(14.0%) and 3(6.0%) of Uda were infected with Anaplasma and Theileria parasites respectively. The West African Dwarf goats were more infected with haemoparasites than the Sokoto Red Goats in the study area while, Balami breed of sheep were found to be infected with only Theileria parasite, Yankasa infected with only Anaplasm parasite while Uda breed was infected with both parasites. There was statistically significant difference (P<0.05) between the breeds of sheep and goats and infection with haemoparasites.

On management of the animals, all the animals sampled were kept semi intensively, 21(10.5%) and 19(9.5%) of the animals were infected with Anaplasma and Theileria parasites respectively. On the health status, all the animals sampled were apparently healthy with 21(10.5%) and 19(9.5%) of the animals were infected with Anaplasma and Theileria parasites respectively. On the state of production, none of the animals were found to be pregnant from examination prior to sampling, 21(10.5%) and 19(9.5%) of the animals were infected with Anaplasma and Theileria parasites respectively.
Discussion

The result above revealed that the prevalence of haemoparasites in sheep and goats raised in Gwagwalada Area Council is relatively low. This could be due to several reasons which include; managerial system, these animals are allowed to roam freely within the area during the day and go back to their house in the evenings and are allowed out again the next morning, also seasonal effect, these research was carried out during dry season, when the weather is coldest (harmattan period) which is similar to the work of Nazet al., done in Lahore-pakistan, seasonal changes was considered and the lowest prevalence was found during this period.

Jegede et al., IJAVMS, Vol. 9, Issue 5, 2015:186-191
Of the four common haemoparasites, the prevalence of *Anaplasma ovis* was highest followed by that of *Thelema ovis* and zero prevalence for both *Eperythrozoon* and *Babesia*. This disagrees with the work of Adejinmi et al., which found a prevalence of *Eperythrozoon* to be 5.2% i.e. about 50% of the sheep sample were positive for haemoparasites. However this difference in haemoparasitism could be due to geographical location as reported in the work of Naz et al., who reported that season has been found as one of the important risk factors that affects the prevalence of these parasites. The prevalence of *Theileria* was variable during different seasons of the year. The prevalence of parasite was more in sheep compared with goat that might be due to the nature of skin. The higher prevalence rate of this parasite in sheep may be attributed to the nature of skin. The goat has thinner skin that seems to be more resistant for the tick compared to sheep. The ticks may easily get entangled in wool of sheep and subsequently may cause infestation. Durrani et al. also noted that sheep were found to be more susceptible to *T. ovis* than goats. In the study, they reported that, prevalence of theileriosis was low in sheep as compared to the prevalence of theileriosis in the District of Okara, this might be due to the different geographic location of both areas. Durrani et al., also observed that geographical distribution of animals affected the prevalence of Theileria in sheep. The relative very low prevalence of Babesiaovis observed in this study is in accordance to earlier report by Bell-Sakyi et al.,. This could probably be due to immunity after infection.

Low prevalence of these parasites in lambs and kids below 6 months of age and higher prevalence in adult sheep and goats could be attributed to transfer of maternal immunity to these young animals, however as these animals ages this maternal immunity wears away and at this period the animal is most susceptible to these parasitic infection, thus adult animals will have more of the parasite and a higher prevalence.

From the result, sex is a factor in haemoparasitic infection in sheep and goats, with the female sex having a higher prevalence than the male, as reported by Rehman et al there is higher prevalence of haemoparasites (theileriosis) in female (16.6%) than male (15.8%) and this could be due to the physiological status of female animals, during periods such as pregnancy, parturition, lactation, the immune status of these animals are significantly compromised thus they are most susceptible to infections and diseases. It is well known that local breeds, although often with less production potential, are more resistant to Tick-borne Diseases (TBDs) than exotics.

Prevalence of blood parasites recorded in this study, the economic gains by the peasant farmers, could be limited, because of the accompanying morbidity, reduced production and growth and fetal mortality. Consequently, this might further discourage the production of small ruminants in this region.

The humid zone has varying levels of tsetse challenge and therefore, small ruminant production is limited to those breeds that can tolerate tsetse transmitted trypanosomiasis. The zone therefore supports trypanotolerant West African dwarf breeds of sheep and goats.

The result of the study shows that a small percentage of the small ruminants kept in the area of study are infected with blood parasites, their owners may not have noticed the effects of the parasites on the animals because they are apparently healthy due to the subclinical or chronic nature of the infection which often do not result in mortality, however their effects is usually manifested in production losses in the form of diminution of productive potential such as decreased growth rate in lambs and kids, late maturity, weight loss, and increased susceptibility to others diseases. It is therefore not surprising that none was pregnant at time of this study.
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There is a need for prevention and control against these parasites of sheep and goats in this area, so that the production potential of these animals will be increased and the economic wellbeing of the owners too improved. Since these parasites are transmitted by ticks, control and prevention should be targeted towards eradicating or reducing the tick population, and this is achievable through the use of acaricides.

References